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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GREGORY S. GLENN

Appeal 2009-1154
Application 10/677,191
Technology Center 1700

Decided:[1] March 16, 2009

Before CHARLES F. WARREN, CATHERINE Q. TIMM, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1-21. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

I. STATEMENT OF THE CASE

The invention relates to a solar cell structure with an integrated by-pass diode. (Spec. ¶ 1). Claim 1 is illustrative of the subject matter on appeal:

1. A solar cell structure having a solar cell unit structure comprising:

a heat sink;

a solar cell having a front side, a back side, and a solar-cell projected area coverage on the heat sink, wherein the solar cell comprises an active semiconductor structure that produces a voltage between the front side and the back side when the front side is illuminated, wherein the solar cell includes a back-side metallization at the back side; and

an intermediate structure disposed between and joined to the back-side metallization of the solar cell and to the heat sink, and having an intermediate-structure projected area coverage on the heat sink, wherein the intermediate structure comprises

a by-pass diode having a diode projected area coverage on the heat sink.

The Examiner relies on the following prior art references to show unpatentability:

Hartman	US 4,577,051	Mar. 18, 1986
Vilela et al. ("Vilela")	US 5,800,630	Sep. 1, 1998
Glenn	US 6,313,396 B1	Nov. 6, 2001

The Examiner maintains the following rejections:

1. Claims 1-15, and 21 rejected under 35 U.S.C. § 103(a) as obvious over Glenn in view of Vilela;

2. Claims 1, 5-8, and 21 rejected under 35 U.S.C. § 103(a) as obvious over Hartman in view of Vilela;

3. Claims 16-18 rejected under 35 U.S.C. § 103(a) as obvious over Hartman in view of Vilela; and

4. Claims 9-10 and 19-20 rejected under 35 U.S.C. § 103(a) as obvious over Hartman in view of Vilela and Glenn.

II. ISSUE ON APPEAL

The dispositive issue presented in this Appeal turns on interpreting the term "heat sink," similarly recited in each of independent claims 1, 11, and 16. The issue is: has the Examiner established a prima facie case that the substrate 20 taught by Glenn and/or the reinforcing tape 22 taught by Hartman are heat sinks, as the term would be construed by one of ordinary skill in the art?

III. FACTUAL FINDINGS

The following Findings of Fact (FF) are relevant to deciding the issue on appeal:

1. Glenn teaches that substrate 20 is "a lightweight, dielectric material" which may be, for example, (a) a graphite frame holding a glass fiber or Kevlar mesh or (b) a Kapton dielectric film adhered to a substrate of graphite or Kevlar impregnated with an epoxy resin. (Glenn, col. 6, ll. 30-44).

2. Appellant's Specification teaches that the heat sink is "preferably made of a metal such as copper or aluminum, or a ceramic of good thermal conductivity such as aluminum nitride." (Spec. ¶ 24).

3. Hartman only describes the non-conducting reinforcing tape 22 as "preferably an adhesive backed polymer tape." (Hartman, col. 4, ll. 16-17).

4. A "heat sink" is defined as "[a] mass of metal that is added to a device for the purpose of absorbing and dissipating heat." (Attachment 1, McGraw-Hill Dictionary of Scientific and Technical Terms, Sixth Ed., (2003)).

5. Graphite has a high thermal conductivity only in one direction (i.e., anisotropically). (U.S. Patent No. 3,451,588, issued June 24, 1969 to Dingwall, col. 4, ll. 51-54; Attachment 2, The Physics Hypertextbook (2008)).

IV. PRINCIPLES OF LAW

The Examiner bears the initial burden, on review of prior art or on any other ground, of presenting a prima facie case of unpatentability. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

During examination, "claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). "Although the PTO must give claims their broadest reasonable interpretation, this interpretation must be consistent with the one that those skilled in the art would reach." *In re Cortright*, 165 F.3d 1353, 1358 (Fed. Cir. 1999).

V. ANALYSIS

The Examiner has interpreted the term "heat sink" too broadly so as to encompass any material positioned adjacent a structure, provided it has the correct dimensions no matter how poor the conductivity of that material. (Ans. 14-15). The definition provided by Appellant (FF 4), in addition to our common understanding of what the term "heat sink" would mean to one of ordinary skill in the art, suggests that one of ordinary skill in the art would not find a structure an effective, or practicable, heat sink unless the material used for the heat sink has a sufficiently high thermal conductivity to effectively move heat away from the heat source. Of all the materials taught by Glenn (FF 1), only graphite has a thermal conductivity as high as that of materials traditionally used as heat sinks (FF 5), such as the example materials cited in Appellant's Specification (FF 2), and only if the material is orientated correctly (FF 5). However, Glenn teaches graphite disposed in a frame structure or as a substrate impregnated with an epoxy resin and in addition to other components, as opposed to a solid block of graphite. (FF 1). Thus, the Examiner has failed to establish that graphite as particularly used by Glenn (even if orientated correctly) would function to effectively remove heat from the claimed solar cell structure.

Likewise, though Hartman specifies no particular polymer material for use as its reinforcing tape 22 (FF 3), the Examiner has not established that the reinforcing tape 22 would have effectively functioned as a heat sink according to one of ordinary skill in the art.

Accordingly, the Examiner has not established a prima facie case that the substrate 20 taught by Glenn or the reinforcing tape 22 taught by

Hartman are heat sinks as the term recited in claims 1, 11, and 16 would be construed by one of ordinary skill in the art.

Since the remaining claims depend from one of claims 1, 11, and 16 and thus incorporate the "heat sink" limitation of claims 1, 11, and 16, we cannot sustain any of the rejections of the Examiner.

VI. CONCLUSION

For the reasons discussed above, we cannot sustain the Examiner's rejections of the claims under 35 U.S.C. § 103(a).

VII. DECISION

We reverse the Examiner's decision.

REVERSED

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